**WASTE DISCHARGE REQUIREMENTS**
**FOR DISCHARGES FROM IRRIGATED AGRICULTURAL LANDS**
**ORDER NO. R4-2023-XXXX**

**APPENDIX 5**

# WATER QUALITY BENCHMARKS BASED UPON TMDL LOAD ALLOCATIONS

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## TMDL Constituents and Compliance Dates

The deadlines in Table 1 take into consideration the relative difficulty in achieving Water Quality Benchmarks for different constituents and are based on TMDL compliance dates, where applicable.

**Table 1: Water Quality Benchmark Compliance Deadlines**

| TMDL Constituents | Compliance Date |
|---|---|
| Malibu Creek Watershed Nutrients TMDL | October 14, 2022 |
| Santa Clara River Nitrogen Compounds TMDL | October 14, 2022 |
| Ventura River Estuary Trash TMDL | October 14, 2020 |
| Calleguas Creek Nitrogen Compounds and Related Effects TMDL | October 14, 2025 |
| Revolon Slough and Beardsley Wash Trash TMDL | October 14, 2020 |
| Upper Santa Clara River Chloride TMDL | October 14, 2020 |
| Calleguas Creek Watershed and Mugu Lagoon Siltation TMDL | March 24, 2015 |
| Calleguas Creek Watershed and Mugu Lagoon Toxicity, Chlorpyrifos, and Diazinon TMDL | March 24, 2022 |
| Ventura River Algae TMDL | June 28, 2019 |
| McGrath Lake OC Pesticides and PCBs TMDL | June 30, 2021 |
| Malibu Creek Watershed Sedimentation and Nutrients TMDL | October 14, 2022 |
| Calleguas Creek Watershed and Mugu Lagoon Metals and Selenium TMDL | March 26, 2022 |
| Calleguas Creek Watershed Boron, Chloride, Sulfate and TDS (Salts) TMDL | Dec. 23, 2023 |
| Santa Clara River Estuary Toxaphene TMDL | October 7, 2025 |
| Calleguas Creek Watershed and Mugu Lagoon OC Pesticides & PCBs TMDL | March 24, 2026 |
| Oxnard Drain #3 Pesticides, PCBs, and Sediment Toxicity TMDL | April 14, 2026 |
| Santa Clara River Bacteria TMDL | March 21, 2023 dry March 21, 2029 wet |

### Calleguas Creek Watershed and Mugu Lagoon OC Pesticides and PCBs TMDL

Compliance with interim and final sediment-based Load Allocations (LAs) is measured as an in-stream annual average at the base of each subwatershed. The Mugu Lagoon subwatershed includes Duck Pond/Agricultural Drain/Mugu/Oxnard Drain #2. The compliance date for the Interim Sediment LAs is March 24, 2006. The compliance date for the Final Sediment LAs is March 24, 2026.

**Table 2: Calleguas Creek Watershed and Mugu Lagoon OC Pesticides and PCBs TMDL Interim Sediment LAs (ng/g) based on subwatersheds**

| Constituent | Mugu Lagoon | Calleguas Creek | Revolon Slough | Arroyo Las Posas | Arroyo Simi | Conejo Creek |
|---|---|---|---|---|---|---|
| Chlordane | 25 | 17 | 48 | 3.3 | 3.3 | 3.4 |
| 4,4-DDD | 69 | 66 | 400 | 290 | 14 | 5.3 |
| 4,4-DDE | 300 | 470 | 1,600 | 950 | 170 | 20 |
| 4,4-DDT | 39 | 110 | 690 | 670 | 25 | 2 |
| Dieldrin | 19 | 3 | 5.7 | 1.1 | 1.1 | 3 |
| PCBs | 180 | 3,800 | 7,600 | 25,700 | 25,700 | 3,800 |
| Toxaphene | 22,900 | 260 | 790 | 230 | 230 | 260 |

**Table 3: Calleguas Creek Watershed and Mugu Lagoon OC Pesticides & PCBs TMDL Final Sediment LAs (ng/g) based on subwatersheds**

| Constituent | Mugu Lagoon | Calleguas Creek | Revolon Slough | Arroyo Las Posas | Arroyo Simi | Conejo Creek |
|---|---|---|---|---|---|---|
| Chlordane | 3.3 | 3.3 | 0.9 | 3.3 | 3.3 | 3.3 |
| 4,4-DDD | 2 | 2 | 2 | 2 | 2 | 2 |
| 4,4-DDE | 2.2 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 |
| 4,4-DDT | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| Dieldrin | 4.3 | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 |
| PCBs | 180 | 120 | 130 | 120 | 120 | 120 |
| Toxaphene | 360 | 0.6 | 1 | 0.6 | 0.6 | 0.6 |

### Calleguas Creek Watershed and Mugu Lagoon Siltation TMDL

A 2,704 tons/yr reduction in sediment yield to Mugu Lagoon is required for agricultural dischargers. The compliance date is March 24, 2015; however a baseline for sedimentation load has not been determined.

### Calleguas Creek Watershed and Mugu Lagoon Toxicity, Chlorpyrifos, and Diazinon TMDL

A load allocation of 1.0 Toxic Units (TUc) applies watershed wide. The compliance date for the Interim Load Allocations is March 24, 2006. The compliance date for the final Load Allocations for Chlorpyrifos and Diazinon is March 24, 2022.

**Table 4: Calleguas Creek Watershed and Mugu Lagoon Toxicity, Chlorpyrifos, and Diazinon TMDL Interim Chlorpyrifos Load Allocations (ug/L), apply watershed-wide**

| Acute (1hour) | Chronic (4 day) |
|---|---|
| 2.57 | 0.810 |

**Table 5: Calleguas Creek Watershed and Mugu Lagoon Toxicity, Chlorpyrifos, and Diazinon TMDL Interim Diazinon Load Allocations (ug/L), apply watershed-wide**

| Acute (1hour) | Chronic (4 day) |
|---|---|
| 0.278 | 0.138 |

**Table 6: Calleguas Creek Watershed and Mugu Lagoon Toxicity, Chlorpyrifos, and Diazinon TMDL Final Chlorpyrifos Load Allocations (ug/L)**

| Subwatershed | Acute and Chronic |
|---|---|
| Arroyo Simi | 0.014 |
| Las Posas | 0.014 |
| Conejo | 0.014 |
| Calleguas | 0.0133 |
| Revolon | 0.0133 |
| Mugu Lagoon | 0.014 |

**Table 7: Calleguas Creek Watershed and Mugu Lagoon Toxicity, Chlorpyrifos, and Diazinon TMDL Final Diazinon Load Allocations (ug/L), apply watershed-wide**

| Acute and Chronic |
|---|
| 0.1 |

**Calleguas Creek Watershed Boron, Chloride, Sulfate and TDS (Salts) TMDL**

Interim dry weather Load Allocations are measured as in-stream monthly averages at the base of each subwatershed, except for chloride which is measured as an instantaneous maximum.

Dry weather Load Allocations apply when flow rates are below the 86$^{th}$ percentile and there was no measurable precipitation in the previous 24-hour period. The 86$^{th}$

percentile flow rate shall be calculated based on flow in the hydrologic year (October 1st – September 30th) that the sample was collected.

Dry weather Load Allocations apply in the receiving water at the base of each subwatershed when flow rates are below the 86th percentile and there was no measurable precipitation in the previous 24-hour period. The 86th percentile flow rate shall be calculated based on flow in the hydrologic year (October 1st – September 30th) that the sample was collected.

The compliance date for the Interim dry weather Load Allocations is December 2, 2008. The compliance date for the Final dry weather Load Allocations is December 23, 2023.

**Table 8: Calleguas Creek Watershed Boron, Chloride, Sulfate and TDS (Salts) TMDL Interim Dry Weather Load Allocations in milligram per litter (mg/L)**

| Constituent | Interim Limit (mg/L) |
|---|---|
| Boron Total | 1.8 |
| Chloride Total | 230 |
| Sulfate Total | 1962 |
| TDS Total | 3995 |

**Table 9: Calleguas Creek Watershed Boron, Chloride, Sulfate and TDS (Salts) TMDL Final Dry Weather Load Allocations (lb/day)**

| Subwatershed | Boron | Chloride | TDS | Sulfate |
|---|---|---|---|---|
| Simi | 641 | 3,631 | 1,068 | 4 |
| Las Posas | 2,109 | 11,952 | 3,515 | N/A |
| Conejo | 743 | 4,212 | 1,239 | N/A |
| Camarillo | 59 | 336 | 99 | N/A |
| Pleasant Valley | 305 | 1,730 | 509 | N/A |
| Revolon | 7,238 | 41,015 | 12,063 | 48 |

**Calleguas Creek Watershed and Mugu Lagoon Metals and Selenium TMDL**

Dry weather Load Allocations apply to days when flows in the stream are less than the 86th percentile flow rate for each subwatershed. Wet weather Load Allocations apply to days when flows in the stream exceed the 86th percentile flow rate for each subwatershed. The 86th percentile flow rate shall be calculated based on flow in the hydrologic year (October 1st – September 30th) that the sample was collected.

Interim load allocations for Mercury are measured in-stream at the base of Revolon Slough and Calleguas Creek.

The compliance date for the Interim Load Allocations is March 26, 2007. The compliance date for the Final Load Allocations is March 26, 2022.

**Table 10: Calleguas Creek Watershed and Mugu Lagoon Metals and Selenium TMDL Interim Load Allocations for total recoverable metals in the Calleguas and Conejo Creek subwatersheds (ug/L)**

| Constituent | Dry Daily Maximum | Dry Monthly Average | Wet Daily Maximum |
|---|---|---|---|
| Copper | 24 | 19 | 1390 |
| Nickel | 43 | 42 | -- |
| Selenium | -- | -- | -- |

**Table 11: Calleguas Creek Watershed and Mugu Lagoon Metals and Selenium TMDL Interim Load Allocations for total recoverable metals in the Revolon Slough subwatershed (ug/L)**

| Constituent | Dry Daily Maximum | Dry Monthly Average | Wet Daily Maximum |
|---|---|---|---|
| Copper | 24 | 19 | 1390 |
| Nickel | 43 | 42 | -- |
| Selenium | 6.7 (c)[1] | 6 (c)[1] | -- |

**Table 12: Calleguas Creek Watershed and Mugu Lagoon Metals and Selenium TMDL Interim Load allocations for Mercury in Suspended Sediment (lbs/year)**

| Flow Range million gallons/year | Calleguas Creek | Revolon Slough |
|---|---|---|
| 0-15,000 | 3.9 | 2 |
| 15,000-25,000 | 12.6 | 4.8 |
| Above 25,000 | 77.5 | 12.2 |

[1] Attainment of interim limits will be evaluated in consideration of background loading data, if available consistent with EPA's 2016 Recommended Aquatic Life Ambient Water Quality Criterion for Selenium in Freshwater.

**Table 13: Calleguas Creek Watershed and Mugu Lagoon Metals and Selenium TMDL Dry Weather - Final Load Allocations in pounds per day (lbs/day) for total recoverable metals for Calleguas and Conejo Creek**

| Constituent | Low Flow | Average Flow | Elevated Flow |
|---|---|---|---|
| Copper[2] | 0.07 x (WER – 0.03) | 0.12 x (WER – 0.02) | 0.31 x (WER – 0.05) |
| Nickel | 0.42 | 0.26 | 0.97 |
| Selenium | -- | -- | -- |

**Table 14: Calleguas Creek Watershed and Mugu Lagoon Metals and Selenium TMDL Calleguas Creek flow category and flow rate in cubic feet per second (cfs)**

| Flow Category | Flow Rate (cfs) |
|---|---|
| Low | 0 - 5 |
| Average | 5 - 21 |
| Elevated | 21 - 30 |

**Table 15: Calleguas Creek Watershed and Mugu Lagoon Metals and Selenium TMDL Dry Weather - Final Load Allocations in pounds per day (lbs/day) for total recoverable metals for Revolon Slough**

| Constituent | Low Flow | Average Flow | Elevated Flow |
|---|---|---|---|
| Copper[2] | 0.07 x (WER – 0.03) | 0.14 x (WER – 0.07) | 0.35 x (WER – 0.07) |
| Nickel | 0.39 | 0.69 | 1.6 |
| Selenium | 0.008 | 0.007 | 0.018 |

[2] The approved site-specific WER of 1.51 for Mugu Lagoon is used to calculate the assigned LAs for discharges to Calleguas and Conejo Creek to ensure the downstream standard is achieved. Agricultural dischargers may apply a WER of up to 3.69 for discharges to upstream reaches, with the exception of Reaches 4 and 5, to calculate the assigned WLAs. If a WER of greater than 1.51 is applied, the agricultural dischargers shall be required to provide detailed quantitative analysis to demonstrate that the WLAs as modified by the WER are protective of downstream reaches. No site specific WER for Revolon Slough was approved so default WER value of 1 is applied. Regardless of the final WERs, total copper loading shall not exceed current loading.

**Table 16: Calleguas Creek Watershed and Mugu Lagoon Metals and Selenium TMDL Revolon Slough flow category and flow rate in cubic feet per second (cfs)**

| Flow Category | Flow Rate (cfs) |
|---|---|
| Low | 0 - 10 |
| Average | 10 - 17 |
| Elevated | 17 - 22 |

**Table 17: Calleguas Creek Watershed and Mugu Lagoon Metals and Selenium TMDL Wet weather final Load Allocations (lbs/day) for total recoverable metals, where "Q" is the daily storm volume (cfs)**

| Constituent | Calleguas and Conejo Creek | Revolon Slough |
|---|---|---|
| Copper[2] | $(0.00017 \times Q^2 \times 0.01 \times Q - 0.05) \times WER - 0.02$ | $(0.00123 \times Q^2 + 0.0034 \times Q) \times WER$ |
| Nickel | $0.014 \times Q^2 + 0.82 \times Q$ | $0.027 \times Q^2 + 0.47 \times Q$ |
| Selenium | -- | $0.1 \times Q^2 + 1.8 \times Q$ |

**Table 18: Final Load Allocations for Agriculture for mercury in suspended sediment (lbs/year)**

| Flow Range MGY | Calleguas Creek | Revolon Slough |
|---|---|---|
| 0-15,000 | 0.5 | 0.2 |
| 15,000-25,000 | 1.9 | 0.8 |
| Above 25,000 | 11.2 | 2.2 |

**Calleguas Creek Nitrogen Compounds and Related Effects TMDL**

The compliance date for the Calleguas Creek Nitrogen Compounds and Related Effects TMDL is October 14, 2025.

**Table 19: Load Allocations for Nitrate-N + Nitrite-N**

| Nitrate-N + Nitrite-N (mg/L) |
|---|
| 9 |

### Revolon Slough and Beardsley Wash Trash TMDL

Load Allocations are zero trash. Dischargers may achieve compliance with the Load Allocations by implementing a minimum frequency of assessment and collection/best management practice (MFAC/BMP) program. By March 6, 2010, agricultural dischargers must demonstrate full compliance and attainment of the zero-trash target's requirement that trash is not accumulating in deleterious amounts between the required trash assessment and collection events. The compliance date is October 14, 2020.

### Upper Santa Clara River Chloride TMDL, Revisions

The compliance date for the Upper Santa Clara River Chloride TMDL is October 14, 2020.

**Table 20: Chloride Load Allocations**

| Reach | Chloride LA (mg/L) |
|---|---|
| 4B, 5, and 6 | 100 |

### Santa Clara River Nitrogen Compounds TMDL

The compliance date for the Santa Clara River Nitrogen Compounds TMDL is October 14, 2022.

**Table 21: Santa Clara River Nitrogen Compounds Load Allocations**

| Reach | $NH_3$-N + $NO_2$-N + $NO_3$-N (mg-N/L) |
|---|---|
| 7 | 8.5 |
| Mint Canyon Reach 1<br>Wheeler Canyon/Todd Barranca<br>Brown Barranca/Long Canyon<br>Other Santa Clara River Reaches | 10 |

### Malibu Creek Watershed Nutrients TMDL

The compliance date for the Malibu Creek Watershed Nutrients TMDL is October 14, 2022.

**Table 22: Load Allocations for Total Nitrogen and Total Phosphorus**

| Season | Total Nitrogen (lbs/day) | Total Phosphorus (lbs/day) |
|---|---|---|
| Summer (April 15 – November 15) | 3 | 0.2 |

**Table 23: Load Allocations for Nitrogen (nitrate-N + nitrite-N)**

| Season | Nitrogen (mg/L) (nitrate-N + nitrite-N) |
|---|---|
| Winter (November 16 – April 14) | 8 |

**Ventura River Estuary Trash TMDL**

Load Allocations are zero trash. Dischargers may achieve compliance with the Load Allocations by implementing a minimum frequency of assessment and collection/best management practice (MFAC/BMP) program. By March 6, 2010, agricultural dischargers must demonstrate full compliance and attainment of the zero-trash target's requirement that trash is not accumulating in deleterious amounts between the required trash assessment and collection events. The compliance date for the Ventura River Estuary Trash TMDL is October 14, 2020.

**Santa Clara River Estuary Toxaphene TMDL**

Within ten years of the compliance date, toxaphene concentrations in fish tissue shall be attenuating such that it appears that numeric targets will be achieved within 15 years. The compliance date of the Santa Clara River Estuary Toxaphene TMDL is October 7, 2025.

**Table 24: Toxaphene fish tissue target and toxaphene allocation for concentration in suspended sediment**

| Reach | Toxaphene Fish Tissue Target | Toxaphene Allocation for Concentration in Suspended Sediment |
|---|---|---|
| Santa Clara River Estuary | 6.1 (µg/kg) | 0.1 (µg/kg) |

## McGrath Lake PCBs, Pesticides and Sediment Toxicity TMDL

The compliance date for McGrath Lake PCBs, Pesticides and Sediment Toxicity TMDL is June 30, 2021.

**Table 25: Water Column Load Allocations and Load Allocations for Concentration in Suspended Sediment**

| Pollutant | Water Column Load Allocation (µg/L) | Load Allocation for Concentration in Suspended Sediment (µg/dry kg) |
|---|---|---|
| Chlordane | 0.00059 | 0.5 |
| Dieldrin | 0.00014 | 0.02 |
| 4,4'-DDT | 0.00059 | 1 |
| 4,4'-DDE | 0.00059 | 2.2 |
| 4,4'-DDD | 0.00084 | 2 |
| Total DDT | -- | 1.58 |
| Total PCBs | 0.00017 | 22.7 |

## Oxnard Drain No. 3 Pesticides, PCBs, and Sediment Toxicity TMDL

The compliance date for the Oxnard Drain No. 3 Pesticides, PCBs, and Sediment Toxicity TMDL is April 14, 2026.

**Table 26: Load Allocations for water and sediments**

| Constituents | Water Allocations, chronic (ug/L) | Sediment[3] | Alternate Sediment[4] |
|---|---|---|---|
| Bifenthrin[5] | 0.0006 | - | - |
| Chlordane, total | 0.00059 | 0.5 | 3.3 |
| Chlorpyrifos[6] | 0.0056 | - | - |
| 4,4'-DDT | 0.00059 | 1 | 0.3 |

[3] Sediment concentrations associated with suspended sediment and Oxnard Drain 3 bottom sediment. Sediment allocations apply if there are fish tissue or sediment toxicity exceedances. All sediment allocations are Effects Range Low (ERL), except toxaphene. Toxaphene does not have an ERL, so the Threshold Effects Level (TEL) concentration was selected.
[4] Sediment concentrations associated with suspended sediment and Oxnard Drain 3 bottom sediment. The alternate sediment allocation applies when the fish tissue target and the sediment toxicity allocation are achieved in Oxnard Drain 3. The alternate sediment allocation concentrations match the Mugu Lagoon TMDL allocations.
[5] Bifenthrin allocations included to address the sediment toxicity impairment.
[6] Chlorpyrifos allocations included to address the sediment toxicity impairment.

| Constituents | Water Allocations, chronic (ug/L) | Sediment[3] | Alternate Sediment[4] |
|---|---|---|---|
| 4,4'-DDE | 0.00059 | 2.2 | 2.2 |
| 4,4'-DDD | 0.00084 | 2 | 2 |
| Dieldrin | 0.00014 | 0.02 | 4.3 |
| PCBs, total | 0.00017 | 22.7 | 180 |
| Sediment Toxicity | - | No significant chronic sediment toxicity | - |
| Toxaphene | 0.0002 | 0.1 | 360 |

**Malibu Creek and Lagoon TMDLs for Sedimentation and Nutrients to Address Benthic Community Impairments**

The compliance date for the Malibu Creek and Lagoon TMDL is October 14, 2022.

**Table 27: Load Allocations for Total Nitrogen and Total Phosphorus**

| Total Nitrogen (mg/L) Summer | Total Nitrogen (mg/L) Winter | Total Phosphorus (mg/L) Summer | Total Phosphorus (mg/L) Winter |
|---|---|---|---|
| 0.65 | 1.00 | 0.10 | 0.10 |

**Ventura River Algae TMDL**

Dry-weather Load Allocations for Agriculture are expressed as daily loads based on an estimated 331 dry-weather days per year.

To assist in implementation of Load Allocations, area-weighted benchmarks can be applied; if used, they shall be 0.008 lb/acre/day TN and $6.3 \times 10^{-5}$ lb/acre/day TP.

The compliance date is June 28, 2019.

**Table 28: Dry-weather Load Allocations**

| Reach | Total Nitrogen (lb/day) | Total Phosphorus (lb/day) |
|---|---|---|
| All Reaches | 16 | 0.12 |

**Table 29 Wet-weather Load Allocations**

| Reach | Nitrate-N + Nitrite-N (mg/L) |
|---|---|
| Estuary | * |
| Reach 1 | * |
| Reach 2 | 10 |
| Cañada Larga | 10 |
| Reach 3 | 5 |
| San Antonio Creek | 5 |
| Reach 4 | 5 |
| Reach 5 | 5 |

**Santa Clara River Bacteria TMDL**

The calculated number of exceedance days assumes that daily sampling is conducted. To determine the number of allowable exceedances for less frequent sampling, a ratio is used.

The interim compliance date is January 31, 2012. The final compliance dates for dry weather and wet weather are March 21, 2023 and March 21, 2029, respectfully.

**Table 30: Interim Allowable exceedance days**

| Time Period | Santa Clara River Reaches 3, 5, 6, & 7 | Santa Clara River Estuary |
|---|---|---|
| Dry Weather | 17 allowable exceedance days of single sample objectives | Not Applicable |
| Wet Weather | 61 allowable exceedance days of single sample objectives | 62 allowable exceedance days of single sample objectives |
| Summer Dry Weather (April 1 – October 31) | Not Applicable | 150 allowable exceedance days of single sample objectives |

| Time Period | Santa Clara River Reaches 3, 5, 6, & 7 | Santa Clara River Estuary |
|---|---|---|
| Winter Dry Weather (November 1 – March 31) | Not Applicable | 49 allowable exceedance days of single sample objectives |

**Table 31: Final Allowable exceedance days**

| Time Period | Santa Clara River Reaches 3, 5, 6, & 7 | Santa Clara River Estuary |
|---|---|---|
| Dry Weather | 5 allowable exceedance days of single sample objectives | Not Applicable |
| | 0 allowable exceedances of geometric mean objectives | |
| Wet Weather | 16 allowable exceedance days of single sample objectives | 25 allowable exceedance days of single sample objectives |
| | 0 allowable exceedances of geometric mean objectives | 0 allowable exceedances of geometric mean objectives |
| Summer Dry Weather | Not Applicable | 10 allowable exceedance days of single sample objectives |
| | | 0 allowable exceedances of geometric mean objectives |
| Winter Dry Weather (November 1 – March 31) | Not Applicable | 12 allowable exceedance days of single sample objectives |
| | | 0 allowable exceedances of geometric mean objectives |